

ملفوظات

Renal Failure:

Renal Failure:

Definition: sudden ^{reversible} deformation in RFT resulting in accumulation of waste product with No Multisystemic involvement.

= [Rapid decline in Renal Function]

X Oliguria = $< 400 \text{ ml / 24 h}$ or $< 35 \text{ ml / h}$

X Creatinin = $> 1 \text{ mg/dl/day}$.

BUN = $1/2$ (urea) $\rightarrow$ (specific gravity)

فلا لو كانت با → هذا ج يكون 30

N.B.:

Asymptomatic elevation of BUN
called "azotemia".

VISIT...

LANZAROTE
Caliente.COM

سبب المرض

Etiology:

↳ A. pre renal cause: 50 - 70% *

★ [1]. ↓ Blood Flow to kidney
= [shock] = Hypotension

Most common cause

❶. Hypovolemic shock:

- Hge
- Vomiting
- Diarrhea
- Burn
- Excessive diuretic
- Diabetes ~~Mellitus~~ insipidus

❷. Cardiogenic shock:

- MI
- HF

❸. Distributive shock:

- 1. ↓ Albumen → Liver cirrhosis, Renal, Malabsorption.

- 2. Septicemia
- 3. Anaphylaxis

- 4. Neurogenic shock

التهمة

خالد و فاطم

➔ (iv) Obstructive shock

- Tension ptx
- PE
- cardiac tamponade

★ [2] Bilateral renal A occlusion

- emboli → cholesterol embolism
contrast ~~embolism~~ angiography
- Dissecting aortic aneurysm

★ [3] Renal A stenosis : = Hypertension

+ ACEIs (OR) NBAIDs

ملفوظات

✓ B. Renal cause: = Interin

✓ ① Acute glomerulonephritis [Rapid progression]

✓ ② Blood vessels:

x cholesterol emboli

x DIC

x TTP

x Hemolytic uremic syndrome
after E. coli infection

x preeclampsia

x Antiphospholipid syndrome

x Scleroderma

x HTN

x Vasculitis = polyarteritis nodosa

✓ ③ Tubular: 10%
ATN = Acute tubular necrosis

✓ ④ Allergic interstitial nephritis

خلاصه ماجد

← C. post renal cause



✓ [1] Bladder:

♂ ← i. BPH . cancer

♀ ← ii. Hematoma after hysterectomy

iii. Neurogenic = Atonic bladder
spinal cord injury

iv. Anticholinergic

✓ [2] Ureter = Bilateral

✓ Stone

✓ Retroperitoneal Fibrosis

[ARF]

Unilateral ureter



N.B

← one kidney

منالو ماجر

* Acute Tubular Necrosis *

x I. Ischemia: = shock

x II. Toxin:

1. Exogenous:

(X) Drug:

- a. Antibiotic → Aminoglycoside
- b. Antiviral → Acyclovir / Indinavir
- c. Antifungal → Amphotericin B
- d. Chemotherapy → Cisplatin

(X) Contrast

2. Endogenous:

- (X) Haemoglobinuria
- (X) Haemolysis
- (X) Myoglobinuria
- (X) parathyroid fed: Hypercalcaemia $Ca^{2+} \uparrow$
- (X) protein → fed Ig → light chain → MM
- (X) Uric Acid increased.

خلافه من

Allergic Interstitial Nephritis

Etiology:

I

Allergy

→ Eosinophil

II

Infection

→ pyelonephritis

→ Legionella

→ TB

→ Leptospira

↓
WBCs cast

Allergic

Drug

① penicillin

② Diuretic

③ B. lactam

④ NSAIDs

⑤ Sulphonamide

⑥ proton pump inhibitor

III

Infiltration

As 1. sarcoidosis

2. Lymphoma

3. leukemia

ملفوظات

pathophysiology:

pre renal Failures

↓ GFR = compensation

VC of afferent arteriole →

VC of efferent arteriole →



PG

Ag II

مقاومة ضغط الدم → C/I #

⊗ NSAIDs → ↓ PG

⊗ ACEIs → ↓ Ag II

↑ Ag II ⇒ ↑ aldosterone

→ ↑ reabsorption of Na⁺ + H₂O

edema لذلك فأنه يمتص

low ← و كذلك Volume امتاع Urine يكون

high ← و بالتالي Osmolarity يكون

high ← و كذلك specific gravity يكون

متلازمة ماكل

وكذلك Na^+ H_2O Low in urine

Fractional excretion Na H_2O

$(FE \text{ Na}) \rightarrow < 1\%$

1. Oligurea = ($< 400 \text{ ml} / 24 \text{ h}$)

2. Osmolarity = ($> 500 \text{ mosm}$) *

3. Specific gravity = (> 1.025) *

4. $\text{Na}^+ = (< 20)$

5. $FE \text{ Na} = < 1\%$

6. Urea & BUN = $\uparrow\uparrow\uparrow$ *

7. $\frac{\text{Urea}}{\text{Creatinine}}$ ratio = ($> 20:1$) * $\rightarrow$ Urea > 40 fold of creatinine

X Urea excreted by glomeruli

X Creatinine

glomeruli + tubule

نظریه واحد

Renal



Glomeruli



Blood vessels



ATN

رفس
pre-renal

Ischemia

tubule

glomeruli اکثر

تأثر (9)

Epithelium + BM تأثر (2)

poor prognosis عند (3)

Toxin

glomeruli

تأثر (9)

epithelium فقط (2)

good prognosis عند (3)

ATN:

تأثر مراحل

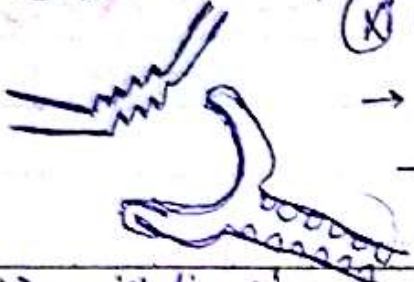
① Oligurea

polyurea

③ Recovery

تأثر

④ obstruction of tubule by epithelium
→ ↑ed Glomerular pressure
→ ↓ GFR → Oligurea



glomeruli

epithelium

Epithelial cast → urine

ملفوظات

11/11/11

Oligurea $\rightarrow$ Ischemia $\rightarrow$ polyurea

Toxin $\rightarrow$ GFR Not increase

$\rightarrow$ oligurea persist and also after Ht bc/ the glomeruli is severely affected

x Ischemia = Oligurea $\rightarrow$ polyurea $\rightarrow$ Recovery

x Toxin = Oligurea $\rightarrow$ Recovery

x polyurea = $> 500 \text{ ml/24h}$

x Osmolarity = < 500

x Specific gravity = < 1.025

x Na = > 20

x FE Na = $> 1\%$

x Urea & BUN

x Urea creatinin ratios $< 20:1$

Na
H₂O
Urine

مقایسه

pre-renal

Renal

	pre-renal	Renal
Volume	> 500 mosm	< 500 mosm
Osmolarity	> 1025	< 1025
Specific gravity	< 20 mmol/L	> 20 mmol/L
Na	< 1%	> 1%
FE Na	> 20:1	< 20:1
Urea & BUN	Yes	No
Urea / creatinine ratio	Yes	No
Edema	Yes	No
Rapid improvement		

pt. presented with anuria with colicky pain

= post Renal RF

دریغ

* KUB

* US

* cystoscopy

خلو و ماحر

المريض يعاني من Oliguria

+ No pain

نشتوفو

BP

Low

إذا كان

Dehydrated

لا لازم نشتوفو حل

أول - ٢

Skin MM

إذا كان غده جفاف في

RX

1. IV Fluid
2. Blood
3. Plasma



Edema

إذا كان غده

Cardiogenic Shock

RX

- x Adrenalin
- x Dobutamine

أول - ٢

Septic shock

RX

- x Antibiotic
- x IV Fluid

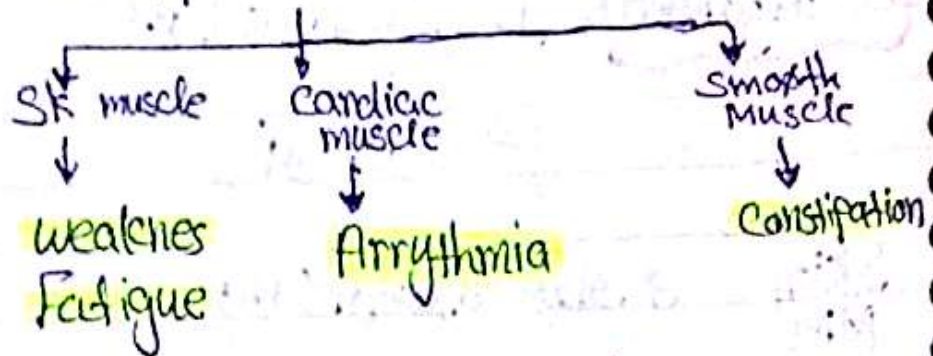
Clinical pic

كلية الطب

Clinical picture + complication:

①. H_2O retention $\rightarrow$ edema $\rightarrow$ pulmonary (PR)
cardiac (PR)
cerebral edema

②. $\uparrow$ ed K^+ $\rightarrow$ Hyperkalemia

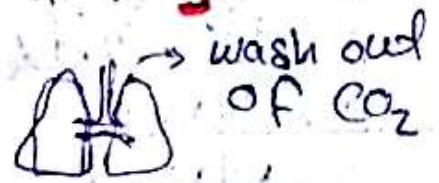


③. PH $\Rightarrow$ Acidosis $[\uparrow H^+ + K^+]$:
27.35

Dysnea
+ Tachypnea

uncompensated
Metabolic

$\rightarrow$ Hyperventilation
Kussmaul breathing



* Main presentation

④. $\uparrow$ ed urea / creatinin

chvrosy

Nausea & Vomiting

Asthenia $\leftarrow$ Flapping tremor

Infection

Bleeding tendency

leukocyte $\rightarrow$ $\uparrow$ ed urea $\rightarrow$ $\uparrow$ ed creatinin
Infl. mediator $\rightarrow$ Fever $\rightarrow$ $\uparrow$ ed urea $\rightarrow$ $\uparrow$ ed creatinin

iron $\rightarrow$ bleeding $\rightarrow$ IDA

⑤. Anemia

⑥. $\downarrow Ca^{2+}$ & $\uparrow P_O_2$

Active Free Ca^{2+}

Acidosis $\rightarrow$ tetany

سؤال

✓ ⑦ Hyper ⑥R Hyponatremia

Inx:

[I] Urine analysis:

test
Uu Au $\bar{p}$ jai Au
pre-renal Failure
Renal Failure

⊗ Volume

⊗ Osmolarity

⊗ specific gravity

→ ⊗ Cast : → epithelial cast + ^{Tam}protein
= Brown granular cast

ATN

→ Dismorphic RBCs cast

Glomerulonephritis

→ Hyaline or empty cast

pre renal Failure

→ Eosinophilic cast

x AIN x Emboli

→ WBCs cast

Pyelonephritis

II. Blood test:

1x Rapid increase in creatinine $> 7 \text{ mg/dl}$ within 24 h

2x $\text{K}^+ \uparrow$ / $\text{H}^+ \uparrow$

3x BUN = $\uparrow$

5x $\text{PO}_4 = \uparrow$

4x $\text{Ca}^{2+} = \downarrow$

6x $\text{Na} = \uparrow$ or $\downarrow$

III. Imaging:

KUB

US

post renal

له شيئا ان يب

Urine ← Foley catheter في urethra

Nephroscopy أو cystoscopy

Stent في

متلازمة مايلر

● pre renal :

● Echo

● Doppler

● Renal : good H/O

● Post renal : Foley catheter → Not pass urine
→ supra pubic catheter → " " "

□ → Bilateral Nephrostomy

TH :

⊗ Pre-renal :

⊗ Renal :

Aim : **GFT** :

1x Mannitol + Furosemide

2x Dopamine [Renal dose]
= low dose

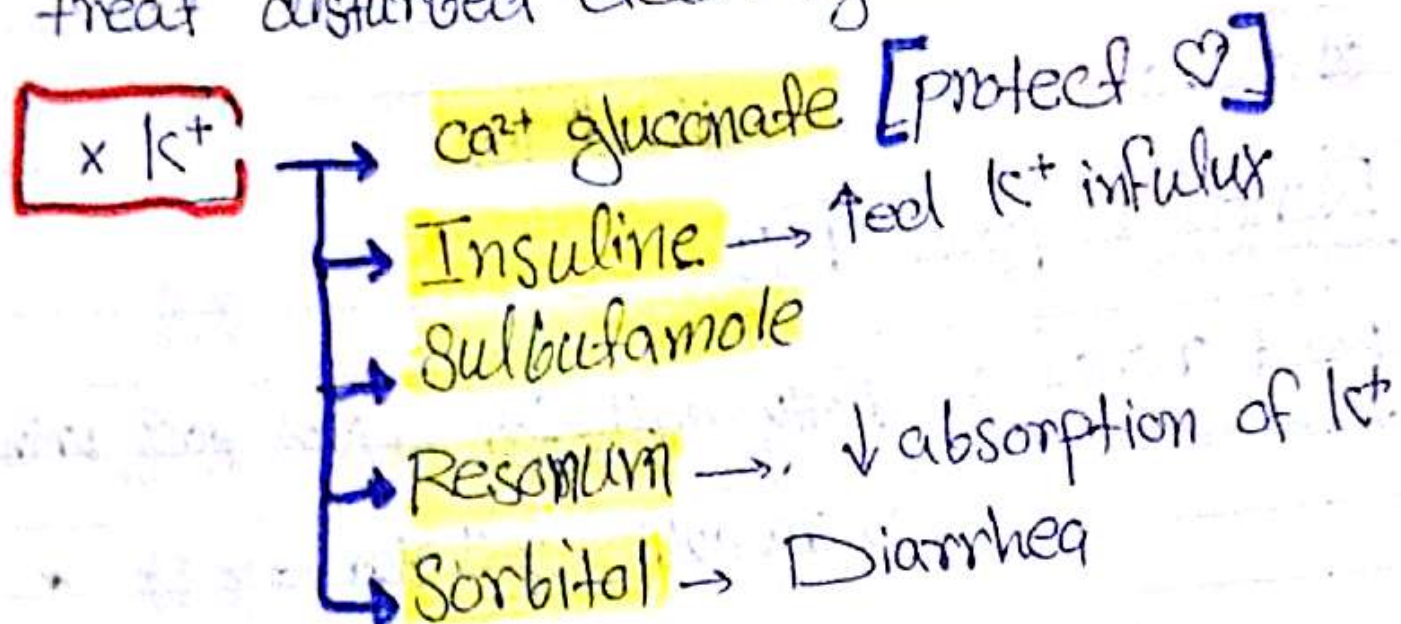
3x Remove toxic agent =
TH underlying cause

التهمة
علاج السبب

4x Single dialysis

نکات

treat disturbed electrolytes:



Acidosis: ☹️ doesn't give HCO_3^- unless:

① $PH < 7.2$

② Severe hyperkalemia

③ $HCO_3^- = < 15$

pg 1: Aluminium hydroxyl gel $\rightarrow$ orally
 $\rightarrow$ $\downarrow$ absorption

Edema: Fluid restriction
+ Monitoring

مؤشر سمي

Toxic : Urea $\uparrow \uparrow \uparrow$ $\rightarrow$ Dialysis

← $\left\{ \begin{array}{l} \text{Hig EHO diet} \\ \text{Low protein diet} \end{array} \right.$
في الدم
نسبة Urea
عالية فانتريش

* Indication of dialysis: **م. ب. د. ا**

✓ ①. Sever edema

✓ ②. Sever $\uparrow K^+$ **> 6** **OR** $pH = < 6$

✓ ③. Urea > 100 **OR** $> 40 \text{ mg/24 hr}$
OR Creatinine $= > 6 \text{ mg/24 hr}$

Serositis = **OR** Uremic pericarditis

* Encephalitis

* Bleeding

N.B: Renal transplant

.. indication من حيث

ب. ا. ب. د. ا
Acute

~ CRF ~

مفهوم الفشل الكلوي

Chronic Kidney Disease
= Chronic Renal Failure

Definition:

3 أسباب
بطيئة

Slowly progressive irreversible
deformation in RFT [GFR = $< 60 \text{ ml/min}$]

with **one** of the following:

① Structural renal abnormality

② Functional
ex: proteinuria / Hematuria

↓ GFR $\xleftrightarrow{\text{creatinine}}$ ↑ creatinine in serum

Stages of CRF:

I: $GFR \geq 90$ + proteinuria + Haematuria

II: $GFR = 60 - 89$ with

III: $GFR = 45 - 59$

IV: " " $= < 30$ but > 15

V: " " $= < 15$

indication of dialysis

Renal impairment IV $\rightarrow$ I stage is X

Renal Failure V stage is X

Etiology:

① DM $\rightarrow$ diabetic nephropathy $\rightarrow$ 30%

② Vascular : (i) HTN $\rightarrow$ 20-25%

(ii) Vasculitis : SLE

(iii) Renal A stenosis

③ Chronic glomerulonephritis : 15%
Burger's disease $\leftarrow$ IgA Nephropathy

ملخص

✓ 4. Idiopathic :

20% - 30%

✓ 5. polycystic kidney :

① Adults

Autosomal dominant

it's the most common cause of CKD inherited

✓ 6. Alpert's syndrome : Ab against BM

⊗ Deafness × Eye problem

✓ 7. Feby's disease

✓ 8. Interstitial Nephritis :

↳ *infection : pyelonephritis

Clinical picture :

× Asymptomatic in most cases ^{في معظم}

× Become symptomatic if GFR < 30ml

⊙ Pericarditis ^{قسط} → ↑ uric acid

وح دافو غدة

ماترد

● Proteinuria / Hematuria / ↑HTN

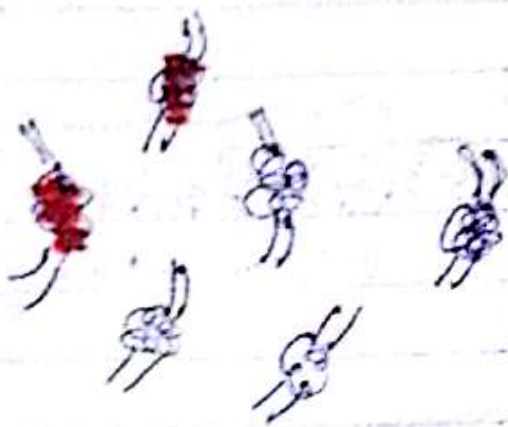
● Anemia of chronic illness: ↓erythropoietin

⊕ pathophysiology:

● Irreversible

DM → 5 years

Microangiopathy



→ ↓GFR → RAAS

⊕ Ang II

⊕ Aldosterone

منه وبالتالي كل يتم يتحول ل glomeruli في

GFR وبالتالي في ينزل ←

* Early CRF وهذا في

1: ↑GFR = polyurea

2: ↑ pressure in glomeruli → sclerosis

→ oligurea

في البداية

في النهاية

DM + HTN

control
delay

ولكن مع في منع صدمات

مخاطر ما قبل

① Fluid ~~ix~~ glomerular disease water retention → edema

ii ~~x~~ Tubular disease water loss

مخاطر

② Electrolytes ~~A~~ K^+ : early stage RAAS early → Ang II & Aldosterone
 في البداية
 ↓
 ⊗ increase $Na + H_2O$ retention

⊗ Hypokalemia في البداية خ يافون

⊗ Late : RAAS. Most of glomeruli damaged
 في البداية
 في البداية

⊗ Hyperkalemia في البداية

→ it's marker of end stage CKD

✓ B $\otimes$ Mg : $\uparrow$

✓ $\otimes$: PO_2 : $\uparrow$

✓ $\otimes$: Ca^{2+} : $\downarrow$

تاثير
 Ca^{2+}

نكود ما

→ chronic hypocalcemia → stimulate parathyroid

→ 2nd hyperparathyroidism → $\downarrow$ ad (OR) Normal ^{lower} 8.5 ng/dl *

if parathyroid still (and) persist

stimulate → hyperplasia → excess of [PTH]

→ 3rd hyperthyroidism → $\uparrow Ca^{2+}$ $\uparrow PO_4$ *

PTH →  cyst → easy fracture
 Ca^{2+}
 Ca^{2+}

Renal (OR) uremic
osteodystrophy
OR
osteitis
Fibrosis cystica

③ PH_2 $\downarrow$ $\uparrow H^+$ → Acidosis

Respiratory

→ stimulate RR →

hyperventilation → Kussmaul breathing

GIT $\downarrow$ → peptic ulcer

$\downarrow$ $\rightarrow$ -ve inotropic → $\downarrow$ contractility

Ca^{2+} $\downarrow$ → $\downarrow$ active free Ca^{2+}

15/6/2019

✓ ④ Wast products

X Urea

X Creatinine

X Uric Acid

500 - 12000
u/s

← X Middle molecule

X Urochrom

= Amber yellow

→ Urea : ① Saliva → color of uremic breath
= Uremic odor

lung ← { ② pleura

③ Bronchus → Uremic Asthma

dialysis ← ④ pericardium = pericarditis

GIT ← ⑤ GIT: Anorexia
Nausea
Vomiting

Skin ← ⑥ Skin: Urea frost

B.N.s ← ⑦ Brain: Encephalopathy

Nerve ← ⑧ Phrenic N: Hiccup

مضاعفات

Creatinin : Not toxic

ليس ساما ولا يضر في الدم ولا يتحول إلى مادة سامة

Sarcosine $\rightarrow$ peripheral neuritis

$\rightarrow$ postural hypotension

$\rightarrow$ Numbness

$\rightarrow$ Bleeding tendency

زيادة نزف عن platelets

Uric Acid = Gout

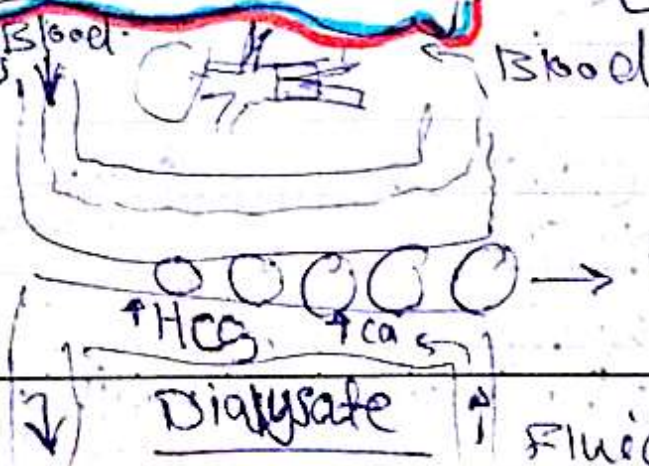
Urochrome pigment

$\times$ colorless urine
لا لون له

$\times$ Brown skin
= earthy colour skin

Middle Molecule : $\times$ toxic substance
Unknown

- Complication of hemodialysis
1. time consuming
 2. Hypotension
 3. Thromboembolism



$\rightarrow$ low permeability membrane

Ureure

Hemodialysis
Hemofiltration
peritoneal dialysis
Renal transplantation } → = Renal Replacement Therapy

- ✓ 5 Erythropoietin: → ↓ Anemia
- ✓ 6 ↓ Vit. D: → ↓ Ca^{2+}
- ✓ 7 ↑ Renin: → ↑ HTN
- ✓ 8 Insuline: = Hypoglycemia
- ✓ 9 ↑ prolactin: galactorrhea
amenorrhea
Impotence & gynecomastia
Subinfertility

Clinical picture:

CNS:

- ✗ Confusion
- ✗ Coma
- ✗ Convulsion
- ✗ Headach

✓ 1x edema

✓ 2x ↑ HTN

✓ 3x waste product

✓ 4x anemia

✗ Uremic encephalopathy: Flapping / Inverted sleep

سليم

CN $\rightarrow$ 8 $\rightarrow$ vertigo
Cerebellum $\rightarrow$ Ataxia

x Esiolysis = Aluminum dementia

Its Dysequilibrium = Brain edema

علاج

Uremic encephalopathy =

Rapid resolution + IV mannitol

سليم

Eye

puffiness $\rightarrow$ xld edema
= Edema x conjunctival chemosis

Mouth

- Uremic odor
- Red glazed tongue $\rightarrow$ Anemia
- Coated tongue

CVS

x HTN x pericarditis

x pericardial effusion

x Myocarditis

x HF

1. Volume overload (H_2O)
2. Arrhythmic (K^+)
3. Acidosis $\rightarrow$ $\downarrow$ contraction
4. HTN $\rightarrow$ $\uparrow$ afterload

x $\uparrow Ca^{2+} \rightarrow$ AS & stenosis

selenium

FA

مقاومة
المرض
العدوى

Lungs

- x pleurisy
- x pulmonary edema
- x Recurrent infection
- x uremic asthma

GIT

- x Candidiasis → Esophagus
- x Gastritis → Stomach
- x Constipation & paralytic ileus → small intestine

↑ Ca^{2+} / ↓ K

① Liver enzyme

② Bilirubin

- x Viral hepatitis

Normal

dialysis

- x Pancrease

pancreatitis

↑ Ca^{2+}

⊕ Auto digestion

Muscle

- 1x Muscle cramps =

↓ Na^{+}

Irritable leg = Restless leg syndrome

- 2x Muscle atrophy

↓

dysuse

- 3x Tetany

rare

b/c prevented by acidosis

Joint

- x Gout

Kidney

- x ↓ size

< 9 cm

= shrunken

- x large

① hydronephrosis

② Adult polycystic

③ Am x icidosis

④ Myeloma

early case of DM

سائل
مخبر

Polycythemia: Anemia
Amyloidosis
Hydronephrosis

Inx:

(A) ↓ GFR

(B) Blood test

→ To confirm diagnosis

1x CBC → Anemia

حیاتی
Folic A⁺ dialysis ← Normocytic Normochromic
Blood loss ← dialysis ← Microcytic
← Macrocytic "Megaloblastic"

2x Electrolyte:

برای خون عالی و برای سرن پایین نا اهن

Na → ↑ OR ↓

K → ↑ OR ↓ → early

PO₄ → ↑

Ca²⁺ → ↓ OR ↑

3x ABG: pH = Acidosis

HCO₃ = ↓

CO₂ = ↓ compensated

(B) Urine: colorless → No urochrome

فحص

✓ (D) Imaging: ^{not a direct} ^{imaging} symmetrical
X US : small : GN / pyelonephritis
large ^{Asymmetrical}

X Doppler doppler : Reveal A stenosis
Broad cast

✓ (E) ANA
Ads DNA } → SLE

✓ (F) Amylase
lipase } → pancreatitis

✓ (G) Echo / ECG

✓ (H) Chest X-ray

✓ (I) CT / MRI

✓ (J) Bone X-ray

✓ (K) Endoscopy

ملاحظات

- ①. ↓ protein
- ②. Avoid exercise,

1H2

x No specific H

x We will H complication :

✓ ①. Antihypertensive

→ ACEI

Calcium → Mandol

Stage I, II or
if not with
CCB / BB
or A blocker

✓ ②. Anti epileptic → Phenytoin

✓ ③. Antihistamine → Famotidine

x Naloxon

x Cholestyramine

✓ ④. TH PU → Ranitidine

✓ ⑤. Vit. D + Ca²⁺ → Bone

Hb = 10mg/dl
الهيموجلوبين
في الدم

✓ ⑥. TH of anemia : Erythroblatin
+ Iron + Folate

✓ ⑦. Selenium → Heart → Metabolism of
energy

✓ ⑧. Diet's CHO ← Fat

as is Fat → ↓

protein → ↓ 1/2g/kg/day

Salt → ↓

Calcium

phosphorus

✓ ⑨. Electrolytes :
Aluminum hydroxide
Ca carbonate

~ ☺ Dialysis ~

JFB 21K

Dialysis

① GFR < 15 ml

< 10 ml

② Creatinine > 8 mg/dl
> 5 → DM

③ Cerebral OR pul. edema

④ Urea ↑ 200

7 no p31

⑤ ↑ K / ↑ Ca²⁺ → ~~---~~

⑥ Drug Toxicity =
* Methanol = Alcohol
* Ethyl glycol
* Aspirin
* Lithium

BLAST →
↓ ↓ ↓

Hemodialysis catheter :

① Femoral A

3 time / week

* Femoral A thrombosis -

② Vein = double lumen = MouHker catheter



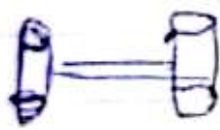
خلود ناصر

انتاج إلى large V وتركة في

Subclavian V (or) internal jugular
SE → thrombosis / infection..

③ AV shunt

بين



A ← { thrombosis
Hge
Infection
HF

B. Hypotension

heparin ok ← C. ↑ risk of thrombosis

d. air embolism

e. Disequilibrium syndrome

f. HIV / hepatitis

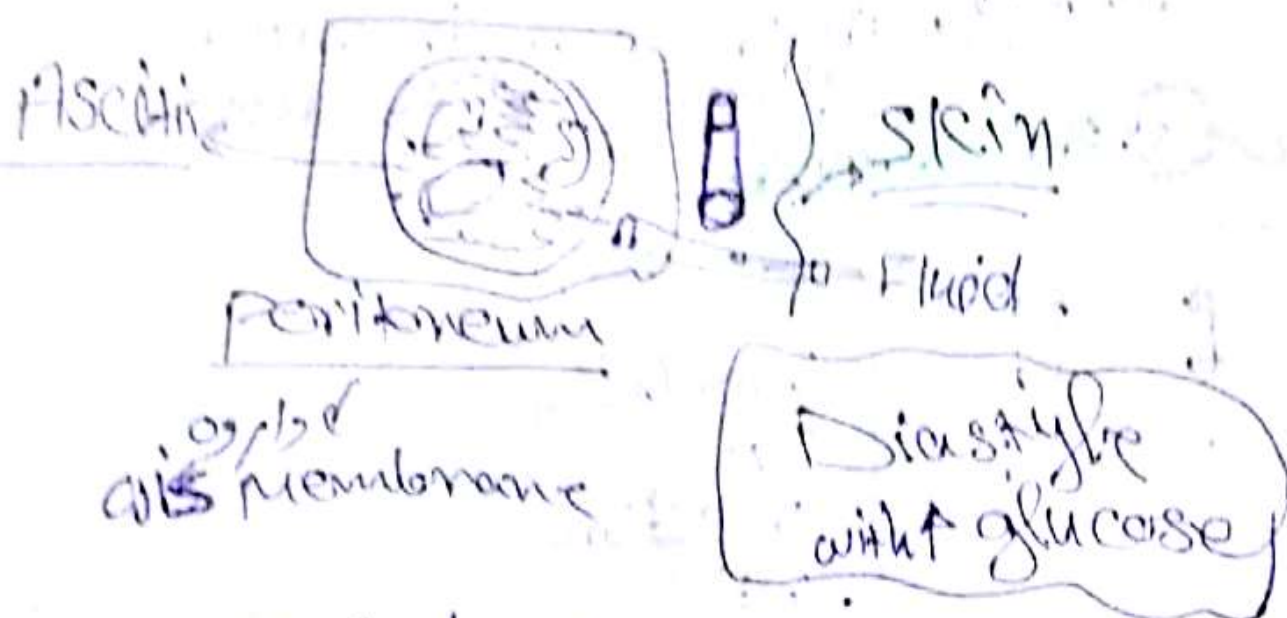
g. Dementia

h. Folate & Iron deficiency

i. ↓ selenium

سكروم

peritoneal dialysis:



Disadvantage

- (i) injury
- (ii) infection
- (iii) Ascitis $\rightarrow$ $\uparrow$ pressure $\rightarrow$ Hernia

$\rightarrow$ CI in:

1x post abd. infect
2x " " " Surgery

$\rightarrow$ Advantage:

- (1) No AV. Fistula
 - (2) No Anticoagulant
 - (3) No hypotension
 - (4) No hepatitis
 - (5) No air embolism
- risk of thromb

مخاطر ما قبل

CI of Renal transplantation

① Sever CVS/pul. disease

② DCM

③ COPD

④ Sepsis

⑤ AIDS

BI



Polyurea

① ↑ Fluid intake

② coffe, tea, cola

③ Cold exposure

④ Diuretic, DM, DI, Tubular damage

⑤ ARF → Rx

⑥ Early stage of CRF

⑦ ($\uparrow \text{Ca}^{2+}$, $\downarrow \text{K}^{+}$) = ↓ sensitivity ADH

⑧ Con's, Cushing

⑨ Migraine

⑩ Diet's crisis

Hematuria:

Def: > 5 RBCs by high power field
Microscopic / Macroscopic

Etiology: I Prerenal

- X Hemophilia A
- X purpura
- X Anticoagulant
- X ~~purpura~~

gum bleeding, epistaxis + purpura

coagulation profile

[PT, APTT, BT]

→ = C/P

IX

سواء يكون للزائدة
أو لا

II Renal:

painful ← x stone
x trauma

→ painless

x hypernephroma
x polycystic kidney

painless mass, tenderness, loin pain → = C/P
x ray / IV pyelogram → IX

الكلى والكلى



II. Post Renal

x Stone (or) Tumor in [UB or urethra]

x UTI

x BPH

terminal
← نرى في البول

initial
← نرى في البول

→ Urethroscope & Cystoscopy

← [IX]

[KUB] X-ray +

Red urine :

كل آ Hematuria بالبرازة إلى

- ✓ ①. hemoglobinurea
- ✓ ②. Myoglobinurea
- ✓ ③. Rifampicin

Brown urine :

Lymphoma

→ Andimalaria

- x Drug: Adriamycin / Chloroquine / Phenacetin
- x Dye: Phenolphthalein
- x Diet: Beef Root → سكر
- x Disease: Porphyria / obstructive jaundice

White urine : → TB / or UTI with antibiotics

@ Uric A

@ pyuria

Cysts

Bladder?

At 30k

1x NEC cyst

Nephritis

CFI

2x Cyst or empty cyst

Nephritis

3x Epithelial cyst

ATN

4x Granular cyst

HB

5x Broad cyst

CFI

6x Hyaline cyst

prerenal ATN

ناتج بول

7x WBCs casts: pyelonephritis / interstitial Nephritis

8x Eosinophilic cast: xcholesterol emboli
x Allergic interstitial nephritis

proteinuria:

x $< 430 \text{ mg} / 24 \text{ h} \rightarrow$ Normal

x Dipstick:

$\geq 300 \text{ mg} / 24 \text{ h}$ يكون البروتين (+ve)

x $130 - 300 \rightarrow$ Microalbuminuria

radioimmunoassay assay
↓
micro immunoglobulin assay

x Nephrotic δ : $> 3.5 \text{ g} / 24 \text{ hr}$

$1.7 \text{ cm}^2 = \text{surface area}$

x Nephritic δ : $< 4.5 \text{ g} / 24 \text{ hr}$

Etiology

⚡ high protein Flow to glomeruli

$\rightarrow \uparrow$ protein in blood $\rightarrow \uparrow \text{Ig}$

lymphoma, leukemia, MM

(precipitation) $\leftarrow$ 55 °C
(resolving) $\leftarrow$ 35 °C
= Bence Jones protein

→ Tubular

✓ ②. Glomerular disease:

- × Fanconi S
- × sickle cell anemia
- × Interstitial Nephritis
- × Urinary tract obstruction

✓ ③. Glomerular disease: GN

✓ ④. Orthostatic التي لا تكون في وضعية
و تختفي عند الاستلقاء Urine عند الاستلقاء

✓ ⑤. False high proteinuria

Haemoglobinure / Myoglobinure

Urea:

× ↑ urea Not always indicate RF

× Normally → 20 - 40 mg

× protein → Ammonia $\xrightarrow{\text{liver}}$ Urea $\xrightarrow{\text{Kidney}}$ Urin

Etiology:

- × ↑ protein intake
- × Trauma
- × Steroid / Cushing
- × Dehydration

موسم

Muscle

Creatinine

قد اش كحبة ليلزها الله ماينا خرابية

X Creatinine clearance → Most accurate

X Creatinine will ↑ in:

renal function

① RF < 50% → ↑ 7 mg/dl

② Muscle damage: X rhabdomyolysis
X cimetidine X Crush

③ False increase in: X DKA - keton body-
X 3rd generation cephalosporins

Glomerulonephritis

inflammation of glomeruli →

bilateral symmetrical

→ usually due to immune reaction

Immune complex

T cell dysfunction

Anti & SM Ab

Ag Ab is deposition
in glomeruli
which activate
complement system

[lumpy appearance]

good posture

lung

hematuria

hemoptysis

مقدمة

Ag-Ab complex

Ag : Exogenous : من خارج

- ① Infection :
 - x Bacterial : Staph, Strept
 - x Viral : Hepatitis
 - x parasite : Malaria, Bilharzia

② Drug : x Depencallamin

من داخل Endogenous :

- ① SLE →
- ② Tumor → leukemia, lymphoma

T cell dysfunction : change minimal
[Neurotic §]

تأثير cortison : Ag : من خارج

GA

Etiology :

- x Neptrotic §
- x Neptritic §
- x ARF
- x CRF

C/P

- x proteinuria
- x Hematuria

من علامات مرض الكلى

Nephritic ♂

Nephritic ♂ = PHAROH

P = proteinuria → Mild: $< 3.5 \text{ g/24 h}$

H = Haematuria → rapid onset

A = Azotemia → elevation of BUN

R = RBCs cast

O = Oliguria → rapid

H = Hypertension

☆ ☆☆ الاختبار عن اللى من علامات نستخرج

x Mild proteinuria → Mild edema

x Haematuria → Micro or Macroscopic

x Oliguria $< 400 \text{ ml/24 h}$ → ↑ HTN

C/P: C/P of RF

I/x: RBCs cast / Oliguria

Blood: x ↑ urea, x ↑ creatinine / x Acidosis

↑ ESR / Antistreptol O Ab / ANA → SLE / Renal biopsy

pericarditis (in / phr)

سالت

IH treat & control $\uparrow$ MN

- i x restriction of fluid & salt
- ii x Diuretic
- iii x CCB

No B. Block

BB $\downarrow$ W.P. $\downarrow$ Nephritic sig. $\downarrow$ is hyperkalemia $\downarrow$ p.p. $\downarrow$ Bradycardia

- (2) Treat underlying cause
- (5) Steroid $\downarrow$ is

Nephritic $\rightarrow$ periorbital edema

Etiology $\rightarrow$ GN

- try $\downarrow$ = idiopathic
- try $\downarrow$
 - (9) immune complex infection
 - Drug
 - Tumor
 - DNA

SLE, R

- (2) ANF. BM AB
- Good posture syndrome
- (2) Radiation

IFD 2011

Post Streptococcal Infection:

- x 2-6 weeks
- x group A, B, HS
- x low serum C_3 + C_4
- x Anti-Streptolysin O AB
- x lumpy bumps
- x supportive tx
- x No biopsy
- x resolve spontaneously within 10-14 days

IgA Nephropathy = Berger's disease

granular

- x following URTI
- x < 5 days
- x Henchen scotline purpura
- x Normal serum C_3
- x it's most common type
- x Tx by steroid

↓
Most common GN
sla
Nephritic
Nephrotic

Wegner granulomatosis

- x c ANCA +ve

Good pasture & c

- x rapidly progressive
- x affect lung + kidney
- x linear anti glomerular BM AB
- x (biopsy + clinical) C_3 & C_4 ↓
- x Tx by plasma phoresis →
- x steroid
- x cyclophosphamide

linear

Nephrotic نفاث نفاث

— Nephrotic syndrom —

urine في $\times$ ^{sever} proteinuria = $> 3.5 \text{ g/24h} / 1.73 \text{ m}^2$

blood في $\times$ Hypoproteinaemia $\rightarrow$ (significant) $\downarrow \downarrow \downarrow$

$\times$ Defect in permeability of glomeruli

$\times \rightarrow$ Non selective proteinuria

$\times$ تلف albumin في liver: تلف $\times$

تلف $\rightarrow$ تلف $\rightarrow$ $\text{LDL} \rightarrow$ تلف $\rightarrow$ تلف

$\times$ **Hyperlipidemia**

$\times$ **No** $\uparrow$ HTN $\checkmark$

$\times$ **No** hematuria $\checkmark$

$\times$ $\uparrow$ protein in urine $\rightarrow$ **Frothy urine**
+ Sever edema

$\times$ $\downarrow$ Albumin / $\downarrow$ globine $\rightarrow$ $\downarrow$ Ig $\rightarrow$ Ab $\downarrow$

immunity low $\rightarrow$ **infection**: pneumococcal
salmonella

مخاطر دواء
في وقت مبكر من العلاج

X Anti-thrombin III $\rightarrow$ Systemic thrombosis

[Heparin] وليس (warfarin) $\rightarrow$ علاج تخثر

X Transferrin $\downarrow \rightarrow$ IDA

X Vit. B binding globulin $\rightarrow$ Megaloblastic anemia

X Thyroxine " " " " $\rightarrow$ تخثر total thyroxine low
Free " " Normal

X Hyperlipidemia + Edema + total T_3, T_4
low $\rightarrow$ Hypothyroidism

وهذا انشعاب خطأ $\downarrow$
نسبة T_3, T_4 التي تكون Free

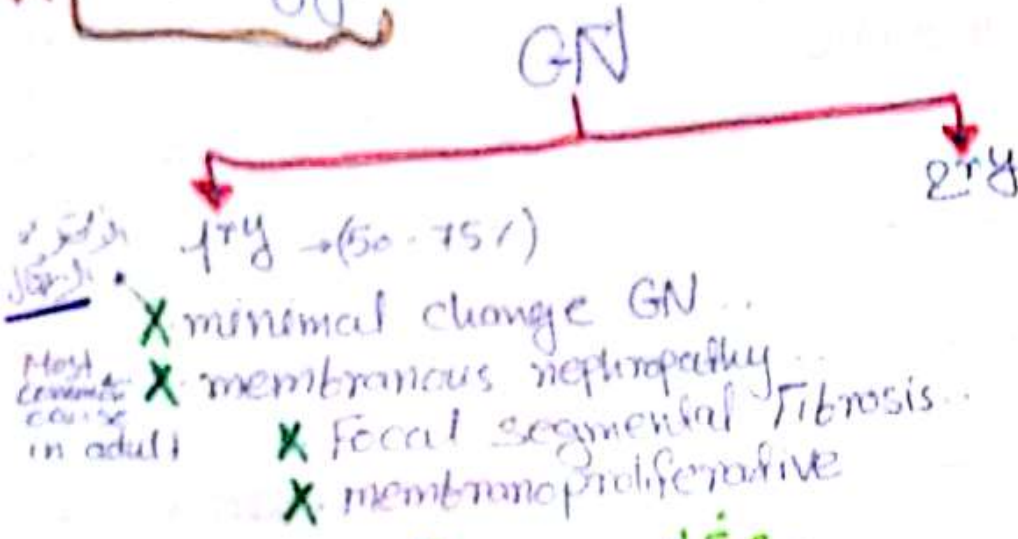
X Ca^{2+} : total : $\downarrow$ / Free : Normal

X Hyperlipidemia $\rightarrow$ Risk For ischemic

X Edema :
x pitting x symmetrical
x Bilateral
x generalized

سفره سالی

Etiology:



biopsy ← confirm نقص

CIP:

- ① Frothy urine
- ② leukonychia
- ③ Total Ca^{2+} ↓
- ④ Infection
- ⑤ Ms. wasting

176

Inx:

- ① Urin analysis: waxy cast
- ② Blood ~ ~ ~: ↓protein 23g/24h
↓ Ca^{2+} / ↓Vit. D
↓iron /

↓Na

منقول

x random blood sugar
x renal biopsy



X **steroid** → 50% will respond to Ht
— 25% No response
— 25% relapse after stop

→ ⊕ cyclophosphamide

X **Replacement therapy**:

→ [Vit. D / Ca^{2+} / Iron / Albumin
/ Statin + control diet + Exercise /
/ Diuretic]

Membranous proliferative

X Caucasian

X ↑ tumor & gastric

X Age > 60

X HBV

X gold therapy

X deposition of IgG + C3 in
BM of glomeruli

التهاب

